Ecosystem Data and Information Needs

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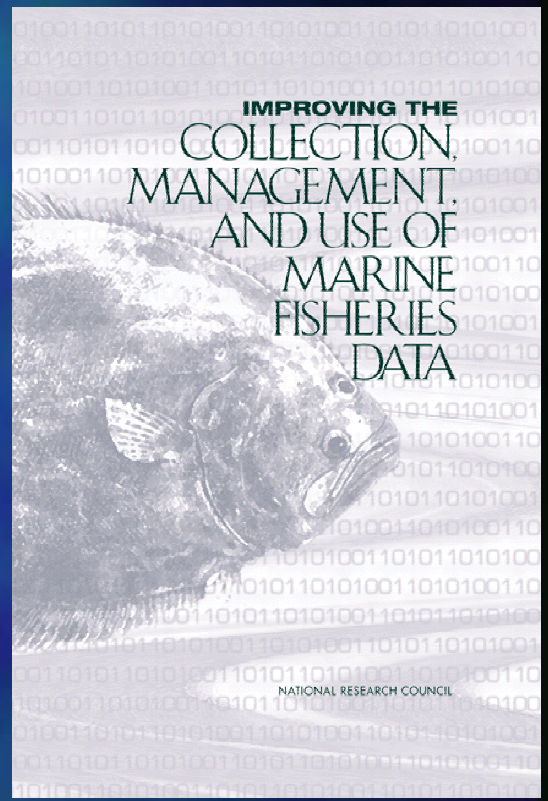
Improving the Collection, Management, and Use of Marine Fisheries Data (NRC 2000)



Information

- Data
  - Observations
    - Scientists & Fishermen
- Sociobiophysical Relationships
- Assumptions
- Evaluation & Experience

General Data/Information Issues

- Data Collection
- Data Management
- Data Use

Data Collection

- Fishery-Independent Data
- Fishery-Dependent Data
- Environmental Data
- Ecosystem Data

Data Management

- Confidentiality
- Institutional Arrangements
- Fisheries Data Management Systems
- Commercial/Cooperative Data Management
- Quality Control
- Technological Advances

Data Use

- Uncertainty Measures
- Metadata
- Data Access
- Management Information for Councils
- Cooperation, Communication, Review

Findings and Recommendations

- Improving
  - Data Collection
  - Data Management
  - Data Use

Improving Data Collection

- Matching Costs to Benefits
- Minimize and Account for "Fouling"
- Fishery-Independent Surveys (Vessels)
- Greater Use of Fishery-Dependent Data
- Commercial Data
  - Standardize, Cooperate, Provide Incentives
- Recreational Data
  - MRFSS, In-season Use, Efficiency
- Socioeconomic Information

Improving Data Management

- Define User Groups and User Needs
- Database Management Systems
  - Fisheries Information System
- Institutional Arrangements
- Standardization
- Quality Control
- Technologies (e.g. Electronic Logbooks and Vessel Monitoring Systems)

Improving Data Use

- Stock Assessments
  - Variety of Approaches (Models)
  - Expressing Uncertainty
- Access
- Confidentiality
- Match Management to Data Available
- Cooperation and Communication
- Review

Research Needs (1)

- Evaluate Ecological Benefits/Impacts
- New Assessment Methods
- Minimize Data Fouling and Misreporting
- Adaptive Sampling
- Explore and Test New Technologies
- Link Environmental, Economic, and Social Data to Biological

Research Needs (2)

- Better Understand Trophic Dynamics
- Understand Economic and Social Motivations of Stakeholders
- Design of Recreational Surveys
- Methods to Treat Commercial and Recreational Data Separately and Realistically

Some Additional Thoughts on Preparing for the Future

- What would RAM Meyers do (or need)?
- Data Mining
  - Let the data guide you (parametric or nonparametric)
  - Statistical Learning
  - Searching for specific patterns
  - Unguided search, classification
  - Additive models, boosting, neural networks
  - Support vector machines, linear discriminant analysis
- Higher order and multidimensional indicators
- Remote sensing data as it relates to fisheries and marine ecosystems
- Collection, storage, and access

- Magnuson-Stevens Act:

  Manage using the best scientific information available.

- Improving Fish Stock Assessments (1998):

  High quality data is necessary for high quality assessments.